

pendulum observations to determine the difference of level between Dehra Dun and Mussoorie.

Valuable results still continue to be obtained from the tidal observations, which extend over forty-two ports from Aden to Port Blair. Tide tables for forty ports are now published in England based on the observations of the Indian Survey. Several instructive tables will be found in the report, especially those showing the errors in the predicted times and heights of high and low water at the various stations. These tables apparently indicate a superiority in the automatic system of recording.

Amongst the most interesting records of the season are the results obtained by a careful re-computation of Captain Wood's observations for determining the position of Everest and other high peaks in Nepal. The more rigorous methods employed give a very slight difference (never amounting to half a second of arc) between the new and old determinations of the coordinate values of the stations of observation, which differences are reflected in a greater degree in the values of the peaks observed, but the corrections in altitude of the peaks observed, due to the employment of a revised coefficient for refraction, are more marked. The height of Mount Everest, for instance, is reduced by about 300 feet (28,700 feet instead of 29,000 feet), and a general reduction in altitude of most of the peaks is apparent. This, however, must not be accepted as a final determination. There are other factors in the computation of altitudes observed under extraordinary conditions still to be determined with more rigorous exactness, and it is quite possible that the ultimate altitude of the highest mountain in the world may be fixed at a higher figure than 29,000 feet rather than a lower one.

A short statement of the progress of topographical surveys in Sind (with no narrative of any interest) and of riverain surveys in the Punjab, with a few notes on town and municipal surveys generally, completes the report.

THE NEEDS OF THE UNIVERSITY OF CAMBRIDGE.

TEN years ago the Duke of Devonshire, as Chancellor of the University of Cambridge, directed attention to the resources and the needs of the University, and at the beginning of 1899 the Cambridge University Association was formed. The progress towards the re-endowment of the University, which it is the object of the association to promote, is described by the Chancellor in a letter of which a copy has been sent to us, and is here summarised.

The sums which the Cambridge University Association has been able to transfer to the University amount in all to about 115,000*l.* Of this total a considerable portion was allotted by the donors to the building of the new medical school, the school of engineering, the proposed new buildings of the Cavendish Laboratory, the school of agriculture, the museum of archæology and ethnology, and to the University library, but a large proportion has been available for general purposes.

Although the progress already made in the equipment of the several departments must be regarded with satisfaction, few of the other wants keenly felt in 1899 have yet been met, and in certain cases new wants have inevitably arisen during the last seven years. In the scientific departments every year must of necessity bring new demands for specialisation in teaching and for the provision of facilities for research. In some departments, notably those of agriculture, engineering, and chemistry, the number of students has greatly increased, and additional accommodation is required.

The greater of the immediate needs of the University may thus be stated. The sum of 18,000*l.* promised for the University library represents only the first instalment of a capital sum of 148,000*l.* required. Chemistry requires 10,000*l.* capital and 2000*l.* income; physics, 12,000*l.* capital and at least 1000*l.* income; engineering, 10,000*l.* capital, and income and equipment for research; botany, 1000*l.* capital and 250*l.* income; physiology, 10,000*l.* capital and 1800*l.* income; agriculture, 20,000*l.* capital (of which 12,000*l.* has been promised) and 600*l.* income; the medical school will cost at least 20,000*l.* to complete, and in

addition a considerable sum is needed for the provision of instruments, &c., and a large income for additions to the teaching staff. Geology asks for 2800*l.* capital and 1300*l.* income. A new, or at least a greatly enlarged, museum of zoology will shortly become necessary, and an income of 1500*l.* is also required for this subject. Entomology, a subject of great importance in its relations to forestry and tropical medicine, is in need of 10,000*l.* capital. Oriental studies require 2000*l.* income. A new museum of archæology and ethnology, urgently needed for the preservation, and for the display for the use of researchers, of the valuable collections possessed by the University, will cost 25,000*l.*, and a considerable income will be required for staff and maintenance. History is in need of 800*l.* income, and a sum for the provision of lecture rooms. Economics require 2000*l.* income, the moral sciences (including experimental psychology) 1400*l.* capital and 1250*l.* income. Classics require about 900*l.* income, and mathematics capital for new lecture-rooms and 3500*l.* income. Law asks for 600*l.* income. Modern languages urgently require a sum sufficient to create professorships in at least English, French, and German (at present represented by two readers and a lecturer), and to ensure the proper representation of other modern languages. There are other needs, some of them not intrinsically less important than those mentioned, but demanding more modest sums for their satisfaction.

The disabilities arising from the low scale of existing salaries are common to almost every department. The average stipend of a professor is but 550*l.*, and that of a university teacher, other than a professor, 250*l.* per annum, and these figures include the emoluments received from fellowships and from fees. The disability is increased by the fact that the University can set aside only 200*l.* per annum to form a pension fund for its forty-four professors, and nothing at all for other teachers. There is, in addition, need for the creation of many new posts.

If the University is to retain the services of its most distinguished men it is imperative that the income assured to them, both during and after the period of active work, should bear comparison with what they may obtain in similar positions elsewhere.

It is stated that in all a capital sum of nearly one million and a half, apart from any question of a pension fund for professors, might without extravagance be immediately expended on the equipment of, and on the provision of staff for, the University.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The professorship of agriculture in the University was established in the year 1899, in consequence of a generous offer by the Drapers' Company to contribute 800*l.* a year for ten years to the agricultural education fund, for the stipend of the professor. The Drapers' Company has now signified its intention to continue its contribution of 800*l.* a year for a further period of ten years, dating from the year 1909, on the understanding that the Department of Agriculture, and the stipend of the professor, shall be maintained as at present. The company has further expressed approval of a suggestion, made by the board of agricultural studies, that the source of the endowment should be indicated, as in the case of some other foundations, by attaching to the chair the title of the "Drapers' Professorship of Agriculture."

The following have been appointed members of the board of electors to certain professorships:—Dr. Keynes and Mr. W. E. Johnson, of King's College, to that of the Knightsbridge professorship of moral philosophy; Mr. F. H. Neville, of Sidney Sussex College, to that of the professorship of chemistry and to that of the Jacksonian professorship of natural philosophy; Prof. Forsyth, to that of the Plumian professorship of astronomy; Prof. Howard Marsh, to that of the professorship of anatomy; Prof. S. H. Vines, to that of the professorship of botany; Dr. Bonney, to that of the Woodwardian professorship of geology and to that of the professorship of mineralogy; Sir Thomas Barlow, Bart., to that of the Downing pro-

fessorship of medicine; Dr. Gaskell, to that of the professorship of zoology and comparative anatomy; Dr. Keynes, to that of the professorship of political economy; Dr. W. N. Shaw, to that of the Cavendish professorship of physics; Prof. J. J. Thomson, to that of the professorship of mechanism and applied mechanics; Prof. C. S. Sherrington, to that of the professorship of physiology; Prof. Nuttall, to that of the professorship of pathology; the Hon. B. A. W. Russell, to that of the professorship of mental philosophy and logic; and Mr. A. E. Shipley, of Christ's College, to that of the professorship of agriculture.

The teachers' training syndicate has appointed Dr. Rouse, of Christ's College, O. Browning, of King's College, and J. Wallis, of Christ's College, as delegates to attend the International Congress on School Hygiene to be held in London next May.

PROF. H. McLEOD, F.R.S., is to receive the honorary degree of LL.D. from the University of St. Andrews at the graduation ceremonial on April 2.

PROF. THOMAS LOVEDAY, professor of philosophy at the South African College, Cape Town, has been appointed librarian to the University of Sheffield.

ARRANGEMENTS have been made for establishing a distinct department of the Board of Education to deal with all grades of education in Wales and Monmouthshire. Mr. A. T. Davies has been appointed permanent secretary of this Welsh Education Department, and Mr. O. M. Edwards chief inspector for Welsh education, and both will be directly responsible to the president.

A REUTER message from Pittsburg announces that the Western University of Pennsylvania will confer the honorary degree of LL.D. upon the following gentlemen, among others, who will be present at the Founders' Day celebrations of the Carnegie Institute on April 13 next:—Sir Robert Ball, Sir William Turner, K.C.B., Sir William Preece, K.C.B., Signor Marconi, Mr. Chalmers Mitchell, Dr. John Rhys, and the Rev. E. S. Roberts, master of Caius College, Cambridge.

A RECENT issue of *Science* contains further striking instances of the importance attached to higher education by wealthy American citizens. Rensselaer Polytechnic Institute has received a gift of 200,000*l.* from Mrs. Russell Sage. The money will be used for the school of mechanical and electrical engineering. Mrs. Sage has also given 200,000*l.* to the Emma Willard School of Troy. The establishment and permanent endowment of Peabody College for Teachers, at Nashville, Tennessee, has also been assured. The Tennessee legislature has just passed a Bill providing the college with 50,000*l.* The city of Nashville has given 40,000*l.*, and the county of Davidson 20,000*l.* These gifts have been made in response to a proposition from the Peabody Education Board to endow the college with 200,000*l.* All the conditions imposed by the Peabody Board have now been complied with, and it only remains for that board to organise the institution. The college will have 310,000*l.* in money. In addition to this, the University of Nashville has given the grounds and buildings now occupied by the college, valued at 50,000*l.* It is understood also that gifts will be received at once from other sources amounting to about 200,000*l.* We also notice that by the will of Arthur Mills, of Brookline, Harvard University will ultimately receive 30,000*l.*

It is satisfactory to learn from the annual report that the Geographical Association, which is doing very useful work in promoting the study of geography in schools by scientific methods, is making substantial progress. In many schools geography is still regarded as a collection of names and phrases which convey no real meaning to the pupils, but, thanks largely to the efforts of the association, both teachers and examiners are beginning to realise that geography must be approached in the spirit of practical inquiry if it is to be of any value as a school subject. Ordnance Survey maps can now be obtained by schools at greatly reduced prices upon application to the Director-General of the Ordnance Survey, Southampton, and suitable maps to supplement these will no doubt be suggested by the committee appointed by the association to consider

the substance and scope of atlases for elementary schools. A special committee on lantern-slides has also been appointed. This committee hopes to prepare series of slides illustrative of certain aspects of geography, as well as of various countries. It is specially anxious to obtain sets of views of different districts in the United Kingdom illustrative of their scenery and social conditions, as well as from British and other lands beyond the seas. Such illustrations, combined with exercises on the construction and use of maps, practical measurements with tape and plane-table, meteorological observations recorded day by day, and the spirit of "Seek and ye shall find" permeating the whole of the work, will transform geography from a dismal study into a living science by which both the imaginative and the critical faculties may be cultivated. We have no sympathy with the old order of things, but the change which the Geographical Association is bringing about gives decided satisfaction.

THE provisional programme of the Federal Conference on Education, organised by the League of the Empire, and to be held in London from May 24 to June 1, includes the following educational subjects:—Teachers: (1) comparison of (a) the provisions for the supply and the training of elementary teachers, and of (b) the conditions of their work in the United Kingdom and other countries of the Empire and Crown colonies; (2) similar comparison in the case of secondary teachers; (3) practicability of temporary interchange of teachers and of inspectors between the United Kingdom and other countries of the Empire and Crown colonies. The relations between secondary and primary schools in the various countries of the Empire. Means of establishing a system of mutual recognition of equivalent standards of attainment in the several countries of the Empire in connection with primary, secondary, and university education. Cooperation in educational publications: (1) scheme of the League of the Empire for Imperial text-books in history; (2) means for ensuring correctness in text-books dealing with geography, or in which local knowledge is required. Cooperation in school work: (1) the formation of a central exhibition of industrial or other school work; (2) the organisation of the exchange of school work and specimens between departments, museums, and between individual schools on a permanent basis. School subjects: (1) the English language: (a) reading (literature), (b) composition, (c) pronunciation; (2) geography in its relations to: (a) history, (b) discovery and commerce; (c) the growth of the Empire, illustrated by lantern slides and other means; (3) encouragement of nature-study. Education of non-British races: comparison of ideals, methods, and standards in various parts of the Empire. Other subjects which may be discussed if time allows: (a) cadet corps and military training; (b) educational facilities in sparsely populated districts; (c) educational treatment of poor law and reformatory children; (d) civic and moral education; (e) metric system of weights and measures; (f) school gardens.

SOCIETIES AND ACADEMIES.

LONDON.

Mineralogical Society, January 29.—Prof. H. A. Miers, F.R.S., president, in the chair.—Experiments bearing on the order of crystallisation of rock-constituents: Prof. H. A. Miers. The general results of experiments made by Miss F. Isaac and Prof. Miers with mixtures of salol and betol in all proportions were described; the experiments have established the supersolubility curves even beyond the points where they cross below the eutectic temperature. Owing to the fact that the main separation of crystals in the cooling mixtures takes place only when the liquids have been supercooled to temperatures given by the supersolubility curves, it has been found (1) that in general the mixtures do not solidify as a eutectic mixture; (2) that, according to the conditions of supercooling, either substance could be made to crystallise before the other in mixtures approaching the eutectic in composition. It was suggested that these results are applicable to the solidification of many rocks and alloys.—Serpentine rock